

GAO

United States General Accounting Office

Report to the Chairman, Committee on  
Armed Services, House of  
Representatives

March 2001

# KOSOVO AIR OPERATIONS

## Army Resolving Lessons Learned Regarding the Apache Helicopter



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## Abbreviations

DOD	Department of Defense
HQDA	Headquarters Department of Army
TRADOC	Training and Doctrine Command





United States General Accounting Office  
Washington, D.C. 20548

March 2, 2001

The Honorable Bob Stump  
Chairman, Committee on Armed Services  
House of Representatives

Dear Mr. Chairman:

Following the failure of peace talks and escalating violence against ethnic Albanians in Kosovo, on March 24, 1999, the United States provided military forces in support of North Atlantic Treaty Organization combat operations against Yugoslavia. Combat operations officially ended on June 20, 1999, with the Yugoslav acceptance of a peace plan and the U.N. endorsement of the plan. Your Committee requested that we examine a number of issues associated with the conduct of these combat operations, called Operation Allied Force. This report, one in a series responding to your requests, addresses the Army's participation in the operation—the deployment of Apache attack helicopters and supporting equipment and personnel, called Task Force Hawk. Our objectives were to (1) examine how Task Force Hawk's concept of operation compared to Army and joint doctrine, (2) review the lessons learned identified from the operation and determine the status of actions to address those lessons, and (3) examine the extent to which the Army and the Air Force were able to operate together as a joint force. We will report separately on other matters involving Operation Allied Force.

## Results in Brief

During Operation Allied Force, Task Force Hawk's mission was to use its Apache helicopters to conduct deep attacks against Serbian forces in Kosovo. Military officials consider the task force and its mission consistent with doctrine, but not typical in that the task force was supporting an air campaign rather than its more traditional role of being used in conjunction with Army ground forces to engage massed formations of enemy armor. According to Army officials, the Task Force Hawk mission was not something the Army routinely trains for.

The Army undertook an extensive effort to identify the lessons learned from Task Force Hawk. In total, it collected 107 unique action items. We categorized the lessons into five broad themes that in our judgment characterize the type of remedial action required: (1) doctrinal revisions; (2) command, control, communications, computers, and intelligence improvements; (3) training changes; (4) additional capabilities needed; and

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(5) force structure changes. The Army is taking remedial actions to address these lessons. As of January 2001, 47 of the 107 lessons have been recommended for closure either because action has been taken or the lessons were no longer germane. However, it will take some time to complete remedial actions on some of the lessons learned that have been recommended for closure. Action is in process for the remaining 60 lessons. Similarly, it may take years to complete action on items in process. The commanding generals of the U.S. Army and Air Force in Europe have placed a high priority on taking remedial action. However, we have reported in the past that the Army has not always been successful in implementing lessons.

The Army and the Air Force experienced significant problems in their ability to work together jointly and in the interoperability of the command, control, communications, computers, and intelligence equipment used during the operation. Both these areas emerged clearly in the lessons learned and are the subject of many remedial actions. The Army has deemed both issues as high-priority items and is working both issues aggressively. However, it will take time for the results to be seen.

To help the Army move forward with its planned remedial actions, we are suggesting that the Congress may wish to have the Army report on progress toward implementing Task Force Hawk lessons learned.

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## Background

Task Force Hawk deployed to Albania in April 1999 as part of Operation Allied Force. Originally, the task force was to deploy to the Former Yugoslav Republic of Macedonia. However, the government of Macedonia would not allow combat operations to be conducted from its territory. The United States subsequently obtained approval from the government of Albania to use its territory to base Task Force Hawk and conduct combat operations. (See fig. 1.) Albania did not have any previously established U.S. military base camps as Macedonia did and was not viewed as having a stable security environment. According to Army officials, the size of the Task Force had to be increased to provide more engineering capability to build operating facilities and provide force protection.

Figure 1: Map of the Balkans



Source: U.S. Army.

The task force was a unique Army organization. It was comprised of 1 attack helicopter battalion with 24 Apache attack helicopters; 1 Corps aviation brigade with 31 support helicopters; 1 Multiple Launch Rocket System battalion<sup>1</sup> with 27 launchers; a ground maneuver element for force protection; and other headquarters and support forces. (See fig. 2 for a

<sup>1</sup>The Multiple Launch Rocket System is an artillery system used to provide suppression of enemy ground forces during an operation.

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picture of an Apache helicopter.) It ultimately totaled about 5,100 personnel. Its planned mission was to conduct deep attacks against Serbian military and militia forces operating in Kosovo using Apache helicopters and Multiple Launch Rocket Systems. The task force deployed to Albania and trained for the mission but was not ordered into combat. Ultimately, its focus changed to using its radar systems to locate enemy forces for targeting by other aircraft. Additionally, the task force assumed responsibility for the protection of all U.S. forces operating out of Tirana Airfield, its staging base, which included Air Force personnel providing humanitarian assistance to Kosovo refugees.

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**Figure 2: Apache Helicopter**



Source: U.S. Army.

Concerned about the combat readiness of Apache helicopters and their experience in Task Force Hawk, the House Armed Services Committee's Subcommittee on Readiness held a hearing on July 1, 1999. That hearing focused on pilot shortages, the lack of pilot proficiency, and unit combat training. In addition, it discussed equipment that was not fully fielded at the time of the operation, such as aircraft survivability equipment and communication equipment. Our work was designed to address other matters associated with Task Force Hawk and how the services plan to address them for future operations.

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## Task Force Hawk Not a Typical Army Operation

Doctrine is the fundamental principle by which the military services guide their actions in support of national objectives. It provides guidance for planning and conducting military operations. In the Army, doctrine is communicated in a variety of ways, including manuals, handbooks, and training. Joint doctrine, which applies to the coordinated use of two or more of the military services, is similarly communicated. Doctrine provides commanders with a framework for conducting operations while allowing flexibility to adapt operations to specific circumstances.

According to Army and Joint Staff doctrine officials, the concept of operation that was planned to be used by Task Force Hawk, the use of Apache helicopters for a deep attack mission as part of an air campaign, fell within established Army and joint doctrine. Typically, attack helicopters are used in conjunction with Army ground forces to engage massed formations of enemy armor. They were used in this manner in the Gulf War.<sup>2</sup> In the Kosovo air campaign, Task Force Hawk's planned deep attacks differed in that they were intended to be part of an air campaign, not an Army led combined arms<sup>3</sup> land campaign. Additionally, the aircraft's planned attacks principally would have engaged widely dispersed and camouflaged enemy ground forces instead of massed formations. According to Army doctrine officials, doctrine is broad and flexible enough to allow a combatant commander to employ his assets in the manner that was planned for the task force. However, Army officials agree that this planned usage differed from the employment typically envisaged in Army doctrine. Furthermore, Army officials said that the Task Force Hawk experience was not something the Army routinely trained for and was considered to be an atypical operation.

Although Task Force Hawk's mission and operations were consistent with both Army and joint doctrine in the broadest sense, changes to doctrine at both the Army and joint levels are being made that will address some of the operation's lessons learned. A total of 19 Army doctrine publications will be developed or modified to better address the experience gained from Task Force Hawk. Examples of new or revised doctrine include a new handbook on deep operations; an update to the Army's keystone warfighting doctrinal

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<sup>2</sup>During the Gulf War, attack helicopters were also used as part of the air campaign to attack Iraqi air defenses.

<sup>3</sup>Combined arms is the integration of the Army's combat capabilities, such as tanks, artillery, and engineer and transportation units.



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publication on conducting campaigns, major operations, battles, engagements, and operations other than war; and an update to the Army aviation brigade field manual that expands the role of aviation brigades and task forces with a heavier emphasis on tactics, techniques, and procedures<sup>4</sup> for task force, combined arms, and joint operations. Modifications to Army doctrine are being made as part of the on-going established process for reviewing and revising doctrinal publications.

A total of five joint doctrine publications will be developed or modified based at least in part on the Task Force Hawk experience. A new joint publication is being developed to cover the role of the Joint Force Land Component Commander, detailing his role and responsibilities in a "supported" and "supporting" role. (See our discussion of this role in the Joint Operations section of this report.) Updates to four remaining joint publications, including close air support and fire support, will be made during the normal 21-month joint doctrine publication and review cycle.

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## Army Working to Implement Lessons Learned

The Army has a large effort underway to collect and resolve lessons learned pertaining to Task Force Hawk. A total of 146 Task Force Hawk lessons learned were collected at three different sources.<sup>5</sup> The U.S. Army Europe developed 64 lessons and forwarded them to the Army's Deputy Chief of Staff for Operations and Plans for remedial action.<sup>6</sup> The Army's Training and Doctrine Command developed a listing of 76 lessons and has assigned them to their different proponent schools for remedial action. Hundreds of joint action items were collected at the European Command on Operation Allied Force and forwarded to the Joint Warfighting Center. Of these items, six were specifically associated with Task Force Hawk and were sent to the Joint Staff for remedial action.

We analyzed the 146 Task Force Hawk lessons and determined that a number of them submitted by different organizations were the same. Of the 76 lessons raised by the Training and Doctrine Command, 38 were similar

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<sup>4</sup>Tactics, techniques, and procedures implement the fundamental principles of military doctrine.

<sup>5</sup>These are the lessons learned collected to date that we are aware of; however, there could be other initiatives.

<sup>6</sup>The U.S. Army Europe developed 66 lessons, but 2 of them did not have anything to do with Task Force Hawk; therefore, we dropped them from the listing.

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to those submitted by U.S. Army Europe. Of the six European Command lessons, we determined that one was similar to an issue submitted by U.S. Army Europe. Deleting the 39 duplicates resulted in a total of 107 unique lessons submitted for remedial action.

We categorized the 107 lessons into five broad themes that in our judgment characterize the type of needed remedial action. The five themes are as follows.

- The need for revisions to Army and joint doctrine, as discussed earlier. We identified 19 such lessons. See appendix I.
- Improvements in command, control, communications, computers, and intelligence (C4I) equipment or procedures. We identified 20 such lessons. See appendix II.
- Areas needing additional training. We identified 30 such lessons. See appendix III.
- The need for additional capability in areas other than C4I. We identified 24 such lessons. See appendix IV.
- Potential force structure changes. We identified 14 such lessons. See appendix V.

We determined the status of each of the 107 lessons learned as of January 2001. We did not evaluate the merit of the actions proposed or completed. We placed them into one of two status categories:

- Recommended for closure: We placed 47 items in this category. However, there are varying degrees of closure within this category. First, there are items that specifically have had actions completed, such as procuring night vision goggles for Apache pilots. According to Army officials, the goggles have been procured and fielded. Twenty-three of the 47 lessons fell into this subgroup. Second, there are lessons that have had actions taken, but will require a long lead-time for implementation, such as the procurement of survival radios and a deployable flight mission rehearsal system for aviation units. For example, while approval for the survival radios has been obtained, they will not begin fielding until fiscal year 2003. In addition, the Army has recommended an interim fix for a mission rehearsal system, but it is costly. The far-term solution is the joint mission planning system, which

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will not be fielded until 2007. Fifteen of the 47 lessons fell into this subgroup. Finally, there are items that Army officials are recommending for closure because, upon further review, they determined the lessons should not have been submitted or events have overtaken the initial lesson and they are no longer applicable. The remaining nine lessons fell into this subgroup. Lessons learned that were recommended for closure are indicated as such in appendixes I-V.

- In progress: We placed 60 lessons in this category. These items are still considered open issues by the Army officials tracking Task Force Hawk lessons learned and they have been assigned to responsible bodies for resolution. Seventeen of the 60 in progress lessons reside with the Department of the Army—Headquarters, 10 with the Joint Staff or Joint Forces Command, 27 with the Army's Training and Doctrine Command, and 6 with U.S. Army Europe. Many issues remain open because they require efforts that are being incorporated into much larger overall Army projects, such as transformation<sup>7</sup> or Flight School XXI,<sup>8</sup> that will require a much longer time frame to implement. Other lessons learned remain open because efforts to address them are just beginning. Lessons learned where solutions are in progress are indicated as such in appendixes I-V.

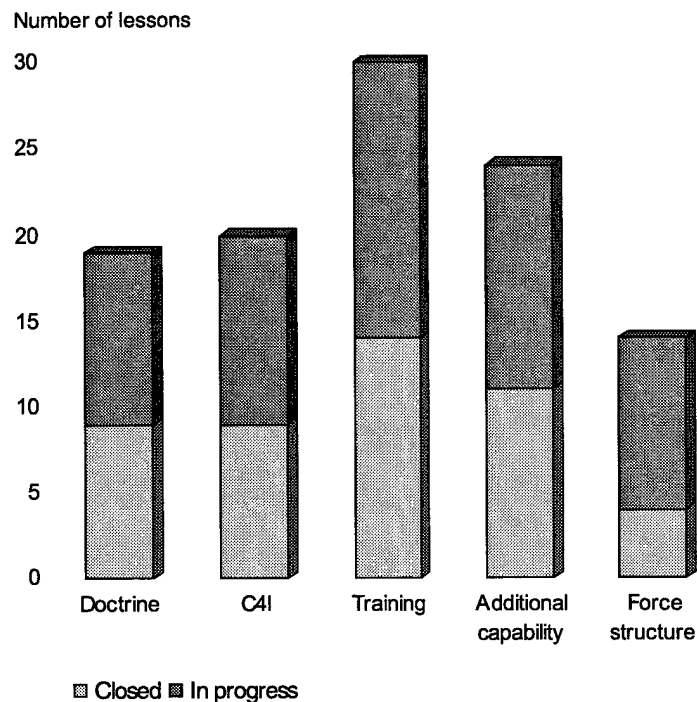
Figure 3 shows the 107 lessons learned issues by category and by status grouping.

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<sup>7</sup>The Army Vision, announced in October 1999, encompasses people, readiness, and transformation. The goal of the Army vision is to transition the entire Army into a force that is strategically responsive and dominant at every point of the spectrum of operations.

<sup>8</sup>Flight School XXI is the Army's project to realign flight training to meet warfighting requirements by producing aviators who arrive at their initial duty station basic mission qualified and ready to begin unit training.

**Figure 3: Status of Task Force Hawk Lessons Learned**



Note: C4I = Command, Control, Communications, Computers, and Intelligence.

Source: GAO analysis of Army and joint lessons learned data.

The Commanding General of U.S. Army Europe has emphasized the need to capitalize on the lessons learned from Kosovo and to focus on partnership with the Air Force. He is personally involved with the lessons learned process and considers the process and follow-up a personal commitment to U.S. Army Europe soldiers. During our visit to U.S. Air Forces in Europe, we were told that their commanding general has also placed a high priority on working together with the Army to address the lessons learned in conducting joint operations. While both commands have taken steps to resolve the issues, some of the remedial actions will require years to complete. In addition, over time the services assign new commanders and reassign the current commanders. We reported in 1999 that while the Army had established a program to validate that remedial action on past lessons

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learned were implemented, the program has not been very successful.<sup>9</sup>

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## Lessons Learned Highlight Problems With Joint Operations and Equipment Interoperability

Two key themes emerged from the lessons learned collected. One was the need for the Army and the Air Force to work together better jointly. The other theme was the interoperability of the two services' command, control, communications, computers, and intelligence equipment.

## Improvements Are Being Made in the Ability to Conduct Joint Operations

The Task Force Hawk experience highlighted difficulties in several areas pertaining to how the Army operates in a joint environment. One area was determining the most appropriate structure for integrating Army elements into a joint task force. Doctrine typically calls for a Joint Force Land Component Commander or an Army Force Commander to be a part of a joint task force with responsibility for overseeing ground elements during an operation. The command structure for the U.S. component of Operation Allied Force did not have a Joint Force Land Component Commander. Both Army officials and the Joint Task Force Commander in retrospect believe that this may have initially made it more difficult to integrate the Army into the existing joint task force structure. The lack of an Army Force Commander and his associated staff created difficulties in campaign planning because the traditional links with other joint task force elements were initially missing. These links would normally function as a liaison between service elements and coordinate planning efforts. Over time, an ad hoc structure had to be developed and links established. The Army has conducted a study to develop a higher headquarters design that would enable it to provide for a senior Army commander in a future Joint Task Force involving a relatively small Army force. This senior commander would be responsible for providing command, control, communications, computers, and intelligence capability to the joint task force. The study itself is complete, but testing of the design in an exercise is not scheduled until February 2002.

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<sup>9</sup>*Military Readiness: Full Training Benefits From Army's Combat Training Centers Are Not Being Realized* (GAO/NSIAD-99-210, Sept. 17, 1999).

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A second area that the Army had difficulty with during its mission training was including its aircraft in the overall planning document that controls air attack assets. The plan, called an air tasking order, assigns daily targets or missions to subordinate units or forces. Air Force officials in Europe told us that they had difficulty integrating the Army's attack helicopters into the air tasking order. According to U.S. Army Europe officials, there were no formalized procedures for how to include Army aviation into this planning document and they had little or no training on how to perform this function. The Army and the Air Force in Europe are developing joint tactics, techniques, and procedures for integrating Army assets into the air tasking order and are beginning to include this process in their joint exercises.

A third area that the Army and the Air Force had difficulty with was targeting. As previously discussed, once the decision was made that Task Force Hawk would not conduct deep attacks, its resources were used to locate targets for the Air Force. According to U.S. Army Europe documentation, Army analysts in Europe had little or no training in joint targeting and analyzing targets in a limited air campaign. As a result, in the early days of the Army targeting role, mobile targets nominated by the Army did not meet Operation Allied Force criteria being used by the Air Force for verifying that targets were legitimate and, therefore, were not attacked. As the operation progressed, the two services learned each other's procedures and criteria and worked together better. The Army and the Air Force in Europe are now formalizing the process used and are developing tactics, techniques, and procedures for attacking such targets and sharing intelligence. They are including these new processes in their joint exercises.

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## Improvements Are Needed in Interoperability

The second major theme that emerged from the lessons learned was the interoperability of the command, control, communications, computers, and intelligence equipment. The Army is transitioning from a variety of battlefield command systems that it has used for years to a digitized suite of systems called the Army Battlefield Command system. During Operation Allied Force, Army elements used a variety of older and newer battlefield command systems that were not always interoperable with each other. The mission planning and targeting system used by the Apache unit in Albania during Task Force Hawk was one of the older systems and was not compatible with the system being used by the Army team that provided liaison with the Air Force at the air operations center. The Army liaison team used the new suite of Army digitized systems that will ultimately be

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provided to all Army combat forces. However, at the time of Task Force Hawk, the suite of systems was not fully fielded and not all the deployed personnel were trained on the new systems. Consequently, the Apache unit in Albania used the older systems, making it difficult to communicate with the liaison team and requiring the manual as opposed to electronic transfer of data.

The older mission planning and targeting system used by the Apache unit in Albania was also not compatible with the Air Force system. The Air Force has a single digital battlefield command system. The Apache unit in Albania, using its older equipment, could not readily share data directly with the Air Force. In addition, the intelligence system being used by the Army at the unit level and at the liaison level could not directly exchange information with the Air Force. As was the case within the Army, personnel had to manually transfer data. This was time consuming and introduced the potential for transcription errors.

The Army is continuing to field the new suite of systems. We have previously reported that the schedules for fielding these systems have slipped and the Army in Europe is not scheduled to receive the complete suite of new systems before 2005.<sup>10</sup> When it is eventually fielded, this new suite of systems is expected to reduce if not eliminate the inability of the Army's and the Air Force's systems to work together.

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## Conclusions

The commanding generals of the U.S. Army and U.S. Air Forces in Europe have made resolving the lessons learned identified from Task Force Hawk a high priority. They have already made progress in taking remedial action on a number of the lessons. However, many of the lessons will require a significant amount of time, sometimes years, for implementation. In addition, over time senior military leadership changes and we have found in the past that the Army has not been very successful in ensuring that remedial actions are brought to closure.

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<sup>10</sup> *Battlefield Automation: Performance Uncertainties Are Likely When Army Fields Its First Digitized Division* (GAO/NSIAD-99-150, July 27, 1999) and *Battlefield Automation: Army Needs to Update Fielding Plan for First Digitized Corps* (GAO/NSIAD-00-167, July 25, 2000).

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## Matter for Congressional Consideration

To ensure that the Army maintains the momentum to take actions to resolve Task Force Hawk lessons learned, the Congress may want to consider requiring the Army to report on remedial actions taken to implement Task Force Hawk lessons. This could be in the form of periodic progress reports or another appropriate reporting approach that would meet congressional oversight needs.

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## Scope and Methodology

To determine how Task Force Hawk's concept of operation compared to existing Army and joint doctrine, we reviewed Army and Joint Staff doctrine publications and were briefed on existing deep attack doctrine at the Army's Training and Doctrine Command and the Army's Aviation School. We then compared this information to Task Force Hawk's concept of operation. We discussed which doctrine publications would be revised based on the Task Force Hawk experience with officials at the Army's Training and Doctrine Command and the Joint Warfighting Center.

To determine the number of Task Force Hawk lessons learned, we collected and reviewed Army lessons learned from the Army's Deputy Chief of Staff for Operations and Plans, the Army's Training and Doctrine Command, and the Center for Army Lessons Learned. We collected and reviewed joint lessons learned at the Office of the Joint Chiefs of Staff and the Joint Warfighting Center. To obtain an understanding of the lessons and their status, we discussed them with individuals directly involved with the Task Force Hawk operation or those directly involved in addressing the individual lessons. We discussed the lessons with individuals at the Army's Aviation School, the Army's Artillery School, U.S. Army Europe, U.S. Air Forces in Europe, and the U.S. European Command.

To determine how well the Army and the Air Force worked together in Operation Allied Force, we collected documentation on joint operations and interoperability of equipment and interviewed personnel at the U.S. European Command, U.S. Army Europe, and U.S. Air Forces in Europe.

We conducted our review from June 2000 through January 2001 in accordance with generally accepted government auditing standards. We reviewed the information in this report with the Department of Defense (DOD) officials and made changes where appropriate. DOD officials agreed with the facts in this report.



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We are sending copies of this report to the Honorable Donald H. Rumsfeld, Secretary of Defense; the Honorable Greg Dahlberg, Acting Secretary of the Army; and the Honorable Mitchell E. Daniels, Jr., Director, Office of Management and Budget.

If you have any questions, please call me on (757) 552-8100. Key contributors to this report were Steve Sternlieb, Laura Durland, and Frank Smith.

Sincerely yours,

A handwritten signature in cursive script that reads "Neal P. Curtin".

Neal P. Curtin  
Director, Defense Capabilities and Management



# Doctrine Change or Implementation Lessons Learned

Lessons learned	Source	In progress proponent
<b>Recommended closed</b>		
The Army and the Air Force use different terms to define strategic airlift's mission status.	U.S. Army Europe	
Joint logistics doctrine needs to be examined with respect to ordnance input.	Training and Doctrine Command (TRADOC)	
Review Field Manual (FM) 100-17— <i>Mobilization, Deployment, Redeployment and Demobilization</i> —to ensure that it meets the requirements of a strategic responsive Army.	TRADOC	
Review FM 100-17 for joint doctrine disconnects and implement the required changes to the pertinent field manuals.	TRADOC	
Review FM 100-17 and FM 100-17-4 to make sure the responsibilities of the major commands are adequately discussed.	TRADOC	
Conduct a mission analysis to determine if doctrine supports the goal of sustaining overmatch capabilities across the spectrum of conflict.	TRADOC	
Determine the operational impact of the Roberts Amendment, which prohibits use of funds for the deployment of U.S. armed forces to Yugoslavia, Albania, and Macedonia without congressional consultation, on alliance and coalition warfare.	U.S. European Command	
<b>Recommended closed but requiring a long implementation period</b>		
Revise publication FM 100-6 entitled <i>Information Operations</i> .	TRADOC	
Accelerate the implementation of doctrine and associated tactics, techniques, and procedures related to FM 3-13 action plan.	TRADOC	
<b>In progress</b>		
Peace support operations doctrine needs to be updated and more fully developed.	U.S. Army Europe	TRADOC
General support aviation doctrine and tactics, techniques, and procedures need to be developed and/or updated.	U.S. Army Europe and TRADOC	TRADOC
There is no available mission-training plan for the Tactical Terminal Control System.	U.S. Army Europe	TRADOC
Aviation war-fighting doctrine for the unmanned aerial vehicle employment with Army aviation is needed.	U.S. Army Europe	TRADOC
Review the need to develop multi-service tactics, techniques, and procedures for Army aviation to support other services or functional components.	TRADOC	TRADOC
Refine doctrine to enable better integration of Army units into joint command and control architecture.	TRADOC	TRADOC
Develop joint tactics, techniques, and procedures for the employment of aircraft survivability equipment.	TRADOC	TRADOC
Revise publication FM 100-5 entitled <i>Operations</i> .	TRADOC	Headquarters Department of Army (HQDA)
Revise publication FM 100-1 entitled <i>The Army</i> .	TRADOC	HQDA
Revise doctrine to include the use of echelons above division elements in the deep attack mission.	TRADOC	TRADOC

# Command, Control, Communications, Computers, and Intelligence Lessons Learned

Lessons learned	Source	In progress proponent
<b>Recommended closed</b>		
Joint Force protection command and control procedures in Albania were not clear.	U.S. Army Europe	
Procedures for video teleconference integration as a command, control, and intelligence structure need to be developed.	U.S. Army Europe	
Albania/Kosovo regional maps were unavailable at the outset of the operation.	U.S. Army Europe	
Tactical human intelligence reconnaissance is lacking in current organizations.	U.S. Army Europe	
Counter and human intelligence needs to be expanded to a joint operating system.	U.S. Army Europe	
The public affairs strategy in Kosovo was not coordinated.	U.S. Army Europe	
<b>Recommended closed but requiring a long implementation period</b>		
All Source Analysis System, which gathers and fuses battlefield information to produce a correlated threat picture, is incompatible with other systems.	U.S. Army Europe	
Accelerate the timetable for fielding the next generation digital series of communications equipment. A 10-year fielding cycle is too slow.	U.S. Army Europe TRADOC	
Improved survival radios are needed for aviation units.	U.S. Army Europe	
<b>In progress</b>		
Upgrade Army aircraft communications capabilities to include satellite communication capabilities.	U.S. Army Europe TRADOC	HQDA
The Army requires an airborne battlefield command and control center to conduct deep attack missions over extended distances.	U.S. Army Europe TRADOC	HQDA
Joint intelligence tactics, techniques, and procedures are lacking.	U.S. Army Europe	Joint Forces Command
Joint analysis is lacking. The primary problem in joint intelligence operations is a lack of service/joint interoperability of intelligence systems.	U.S. Army Europe	Joint Forces Command
Additional facilities and capabilities to increase bandwidth within the intelligence and signal communities are needed.	U.S. Army Europe	Joint Forces Command
Joint intelligence, doctrine, and training need to be better coordinated and integrated.	U.S. Army Europe	Joint Forces Command
Second generation forward-looking infrared sensors are needed.	TRADOC	TRADOC
The Dual Datalink, which supports intelligence operations, must be replaced.	European Command	Joint Forces Command
The Army space support team needs improved technologies, including a direct satellite downlink capability, to provide satellite imagery to the warfighter.	European Command	Joint Forces Command
Command, control, communications, computers, and intelligence operations, organizations, and materiel for the Army in a supporting role needs to be analyzed. (TRADOC has expanded this single issue to 32 separate issues.)	TRADOC	TRADOC
Determine the appropriate design and augmentation required to enable a division or corps to act as an Army Force Commander, which would provide command, control, communications, computers, and intelligence to the forces.	TRADOC	TRADOC

# Training Lessons Learned

Lessons learned	Source	In progress proponent
<b>Recommended closed</b>		
Obtain required airspace allocations for conducting Guardrail training in Europe.	U.S. Army Europe	
Develop over-water and alpine training areas in Europe.	U.S. Army Europe	
Require annual under-wire flight training and have local commanders establish areas to perform training.	U.S. Army Europe	
Aviation training manuals should be modified to include asymmetrical threats, special instructions on how to use air tasking orders, unit integration into North Atlantic Treaty Organization operations, annual joint air attack team training, and a minimum planning time mission rehearsal exercise.	U.S. Army Europe TRADOC	
Find an integrated, complex air defense range for conducting electronic warfare training or obtain the necessary waivers for use of the range at Polygon, France.	U.S. Army Europe	
Conduct mission analysis to determine if deployment requirements are covered in unit training programs.	TRADOC	
Provide a product that describes the roles, missions, and functions of the U.S. Transportation Command to all Army schools for inclusion in their training opportunities.	TRADOC	
Continue emphasizing military decision-making process training.	TRADOC	
Incorporate task force operations instruction in professional military education.	TRADOC	
<b>Recommended closed but requiring a long implementation period</b>		
The current Battle Command Training Program fails to adequately address the joint/combined operational environment of current and future contingencies.	U.S. Army Europe TRADOC	
Increased individual, crew, and junior leader development training is needed.	U.S. Army Europe TRADOC	
Platoon Leader/Company Commander certification and training is inadequate as currently executed.	U.S. Army Europe TRADOC	
Increase the level of survival, evasion, resistance, and escape training.	U.S. Army Europe TRADOC	
A joint/combined multinational training event is required.	U.S. Army Europe TRADOC	
<b>In progress</b>		
Increased officer, noncommissioned officer, and advanced individual training is needed.	U.S. Army Europe TRADOC	TRADOC
Revise training to ensure new Apache helicopter pilots are basic mission qualified.	U.S. Army Europe TRADOC	TRADOC
There is a need for signal intelligence survey teams in the Army.	U.S. Army Europe	HQDA
Fully fund ammunition requirements for appropriate aviator training to include advanced gunnery.	U.S. Army Europe	HQDA
Provide a realistic radar threat generator for flight training. The current system only replicates a minimal amount of threat systems.	U.S. Army Europe	HQDA
Fund travel costs associated with U.S. Army Europe units attending required training schools.	U.S. Army Europe	U.S. Army Europe

**Appendix III  
Training Lessons Learned**

<b>Lessons learned</b>	<b>Source</b>	<b>In progress proponent</b>
U.S. Army Europe needs to continue efforts to remove, extend, or modify the current night flight, frequency management, and radar utilization restrictions in Germany to support training.	U.S. Army Europe	U.S. Army Europe
Simplify procedures for obtaining identification of friend or foe interrogation training. <sup>a</sup>	U.S. Army Europe	U.S. Army Europe
Require and resource for each attack squadron a complete Combat Maneuver Training Center force-on-force rotation.	U.S. Army Europe	U.S. Army Europe
Emphasize how the major commands fit into the Joint Deployment Process.	TRADOC	Joint Forces Command
The services need to continually reinforce and train on joint deep operations in order to maximize warfighting capabilities.	U.S. European Command	Joint Forces Command
Integrate high gross weight operations and complex terrain training in simulation mission scenarios.	TRADOC	TRADOC
Utilize simulation to drive training scenarios.	TRADOC	TRADOC
Aviation mission planning systems rehearsal tool for individual and crew utilization does not meet training requirements.	TRADOC	TRADOC
Review and ensure applicability of digitized systems.	TRADOC	TRADOC
Develop a deployment training exercise with the objectives of understanding the deployment process and developing synchronized movement plans.	TRADOC	HQDA

<sup>a</sup>In February 2001, U.S. Army Europe advised us that it had moved this lesson learned to the recommended closed category.

# Additional Capability Lessons Learned

Lessons learned	Source	In progress proponent
<b>Recommended closed</b>		
Field night vision goggles.	U.S. Army Europe TRADOC	
Institutionalize the concept of tiered force provider packages to support Army units, including force protection materials.	U.S. Army Europe	
The aerial weapon scoring system needs further development and refinement.	U.S. Army Europe	
The Army needs to conduct additional deployment training and buy additional C-17 mock-up trainers for Europe.	U.S. Army Europe TRADOC	
Procure and field the transportation coordinator's automated information movement system II.	TRADOC	
The Army needs to continue to support and deploy systems, such as the Deployable Weather Satellite Workstation, that autonomously process weather satellite imagery and data.	U.S. European Command	
<b>Recommended closed but requiring a long implementation period</b>		
Field a deployable flight mission rehearsal system.	U.S. Army Europe TRADOC	
Field a night vision system compatible with nuclear biological chemical masks.	U.S. Army Europe	
Develop and field a new time-phased force and deployment data system.	U.S. Army Europe TRADOC	
Upgrade Army aviation mission simulators.	U.S. Army Europe TRADOC	
Procure and field the aviation combined-arms training suite into brigade and below training.	TRADOC	
<b>In progress</b>		
Develop, resource, train, and sustain a combat search and rescue capability.	U.S. Army Europe	Joint Forces Command
The Apache helicopter requires extended range/self-deployment fuel tanks that are crashworthy.	U.S. Army Europe TRADOC	HQDA
Upgrade Army aviation aircraft survivability equipment.	U.S. Army Europe TRADOC	HQDA
Modify Apache Longbow to meet specific theater requirements to include better night vision systems, more powerful engines, increased communications, and better aircraft survivability equipment.	U.S. Army Europe	HQDA
The Army requires a self-contained lethal and non-lethal joint suppression of enemy air defenses capability.	U.S. Army Europe	Joint Forces Command
Field additional tactical engagement simulation systems to the Combat Maneuver Training Center as well as what is currently funded for the Apache Longbow.	U.S. Army Europe	HQDA
Fund the Apache helicopter self-deployment capability to include instrument flight rules and an approved global positioning system.	U.S. Army Europe	HQDA
Fund the procurement of aviation life support equipment for over-water operations.	U.S. Army Europe	TRADOC
The closed loop facility at Ramstein, Germany, requires additional equipment for major strategic air deployments.	U.S. Army Europe	U.S. Army Europe

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**Appendix IV**  
**Additional Capability Lessons Learned**

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<b>Lessons learned</b>	<b>Source</b>	<b>In progress proponent</b>
U.S. Army Europe requires an alternate strategic deployment airfield.	U.S. Army Europe	U.S. Army Europe
Fund Robertson fuel tanks and rotor blade anti/de-ice capability.	U.S. Army Europe	HQDA
Procure system to track flight experience.	TRADOC	TRADOC
Continue research and development of imagery transmission systems.	TRADOC	TRADOC

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# Force Structure Lessons Learned

Lessons learned	Source	In progress proponent
<b>Recommended closed</b>		
Public affairs staff support is inadequate. Additional units are required.	U.S. Army Europe	
Guardrail units need to be filled at 100 percent.	U.S. Army Europe	
Need to review Army guidance to determine if multifunctional logistics officer qualifications need to be modified.	TRADOC	
Authorize tactical operation officers for electronic warfare officer positions.	TRADOC	
<b>In progress</b>		
Revise the Apache helicopter squadron's force structure to include a fire support officer and an air defense artillery officer.	U.S. Army Europe	HQDA
Field unmanned aerial vehicle units at corps level.	U.S. Army Europe	HQDA
Add sufficient personnel to the force structure of the corps and division headquarters to allow for commanders to conduct split-based operations.	U.S. Army Europe TRADOC	TRADOC
Add an Apache helicopter qualified field grade officer in the executive officer or operations officer position of the battlefield coordination detachment.	U.S. Army Europe	HQDA
The Army requires the ability to rapidly deploy forces to anywhere in the world and sustain overmatch capabilities across the full spectrum of operations. The Infantry School is developing an interim brigade combat team that has greater tactical and strategic agility.	TRADOC	TRADOC
The Army needs to look into a redesign of what is needed at echelons above division in terms of ordnance combat service support to enhance joint and combined operations.	TRADOC	TRADOC
New materiel requirements for the Ordnance Corps can be anticipated as a result of the Army's development of the initial brigade combat team.	TRADOC	TRADOC
To support rapidly developing contingencies and promote efficiency, the Army needs to evaluate consolidating combat service support.	TRADOC	TRADOC
Continue to build support for fielding a cargo transfer company.	TRADOC	TRADOC
Formalize a tactical operations career field for electronic warfare officer.	TRADOC	TRADOC

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